

*Obviously we must do some serious rethinking
of our priorities, lest linguistics go down
in history as the only science that presided
obliviously over the disappearance of 90 percent
of the very field to which it is dedicated.*

—Michael Krauss, "The World's Languages in Crisis" (*Language*, 1992)

Linguists have known for years that thousands of the

SAVING

world's languages are at grave risk of extinction.

Yet only recently has the field summoned the will—

LANGUAGES

and the money—to do much about it

By W. Wayt Gibbs



Ten years ago Michael Krauss sent a shudder

through the discipline of linguistics with his prediction that half the 6,000 or so languages spoken in the world would cease to be uttered within a century. Krauss, a language professor at the University of Alaska-Fairbanks, had founded the Alaska Native Language Center to try to preserve as much as possible of the 20 tongues still known to the state's indigenous people. Only two of those languages were being taught to children. Several others existed only in the memories of a few aged speakers; the rest were rapidly falling from use. The situation in Alaska was emblematic of a global pattern, Krauss observed in the journal of the Linguistic Society of America. Unless scientists and community leaders directed a worldwide effort to stabilize the decline of local languages, he warned, nine tenths of the linguistic diversity of hu-

mankind would probably be doomed to extinction.

Krauss's prediction was little more than an educated guess, but other respected linguists had been clanging out similar alarms. Kenneth L. Hale of the Massachusetts Institute of Technology noted in the same journal issue that eight languages on which he had done fieldwork had since passed into extinction. A 1990 survey in Australia found that 70 of the 90 surviving Aboriginal languages were no longer used regularly by all age groups. The same was true for all but 20 of the 175 Native American languages spoken or remembered in the U.S., Krauss told a congressional panel in 1992.

On the face of it, the consolidation of human language might seem like a good trend, one that could ease ethnic tensions and aid global commerce. Linguists don't

deny those benefits, and they acknowledge that in most cases small communities choose (often unconsciously) to switch to the majority language because they believe it will boost their social or economic status.

Many experts in the field nonetheless mourn the loss of rare languages, for several reasons. To start, there is scientific self-interest: some of the most basic questions in linguistics have to do with the limits of human speech, which are far from fully explored. Many researchers would like to know which structural elements of grammar and vocabulary—if any—are truly universal and probably therefore hardwired into the human brain. Other scientists try to reconstruct ancient migration patterns by comparing borrowed words that appear in otherwise unrelated languages. In each of these cases, the wider the portfolio of languages you study, the more likely you are to get the right answers.

"I think the value is mostly in human terms," says James A. Matisoff, a specialist in rare Asian languages at the University of California at Berkeley. "Language is the most important element in the culture of a community. When it dies, you lose the special knowledge of that culture and a unique window on the world."

In 1996 linguist Luisa Maffi helped to organize a group called Terralingua to draw attention to the apparent link be-

Overview/*Endangered Languages*

- The latest edition of the *Ethnologue* lists 7,202 languages spoken worldwide, 440 of them within a generation or two of extinction. Allowing for some mislabeling of dialects, most linguists put the number of distinct languages between 5,000 and 7,000. Most also accept rough projections that without sustained conservation efforts, half or more of these will fall out of use by the end of the century.
- A small fraction of languages have been documented well enough to test theories of universal grammars, language evolution, and many other unanswered questions in linguistics and anthropology.
- Linguists have only recently begun to organize large-scale efforts to save dying languages. A new \$30-million field research project set to begin early next year will increase the funding committed to such work by nearly 10-fold.

DIVERSITY IN JEOPARDY: LANGUAGES AND LIFE-FORMS

BIOLOGICAL AND LINGUISTIC diversity are often highest in the same countries of the world, a correlation that has prompted some researchers to suggest that the two are linked. But when the biological "hot spots" that have the highest density of endemic plant and vertebrate species (*orange-red highlights*) are mapped along with endangered and recently extinguished languages (*dots and crosses*), a more complicated picture emerges. If there is a link between biodiversity and language variety, it is not a straightforward one.



JOYCE PENDOLA; SOURCES, *ATLAS OF THE WORLD'S LANGUAGES IN DANGER OF DISAPPEARING*, SECOND EDITION, UNESCO PUBLISHING, 2001, "BIODIVERSITY HOTSPOTS FOR CONSERVATION PRIORITIES," BY NORMAN MYERS ET AL. IN *NATURE*, VOL. 403, PAGES 853-858, FEBRUARY 24, 2000

Endemic Plant and Vertebrate
Species per 100 Square Kilometers



Threatened Languages
+ Recently Extinct
● Moribund
● Endangered
● At Risk

ETCHING A NEW ROSETTA STONE

THE HIEROGLYPHIC LANGUAGE of ancient Egyptians was lost until Napoleon's troops discovered a 1,000-year-old slab of basalt in the Nile village of Rosetta. Etched into its black face were three copies of the same text: one in demotic, one in Greek and one in hieroglyphic Egyptian. With that key, scholars were able at last to unlock millennia of hidden history.

The Rosetta stone survived by chance, but it has inspired a small group of engineers and scientists to deliberately fashion a new artifact that could preserve some basic knowledge of the world's languages for anthropologists of the distant future. Jim Mason, who directs the Rosetta Project for the Long Now Foundation in San Francisco, says the group is on schedule to complete its first "stone" this autumn.

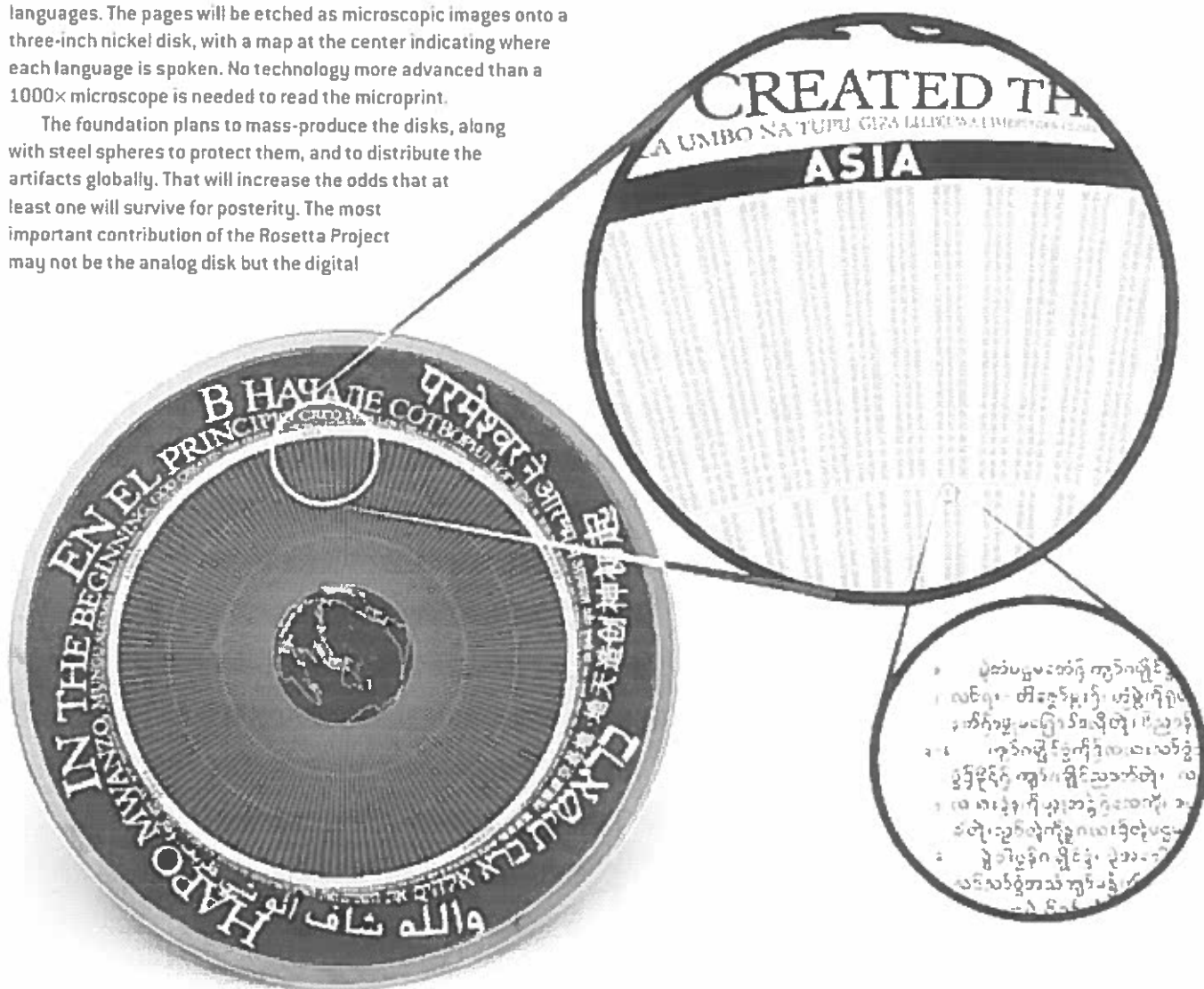
Like the original, this new Rosetta stone will carry parallel texts (the first chapter of Genesis), transliterated if the language has no native script. But its design allows it to hold much more detail—27 pages of glossed text and English description for each of 1,000 languages. The pages will be etched as microscopic images onto a three-inch nickel disk, with a map at the center indicating where each language is spoken. No technology more advanced than a 1000× microscope is needed to read the microprint.

The foundation plans to mass-produce the disks, along with steel spheres to protect them, and to distribute the artifacts globally. That will increase the odds that at least one will survive for posterity. The most important contribution of the Rosetta Project may not be the analog disk but the digital

database of word lists for 4,000 to 5,000 languages that the group wants to complete next. "We already have word lists in digital form for 2,000 languages," Mason says. Scientists at the Santa Fe Institute, he adds, are keen to use the database to refine the picture of language evolution and human migration.

To fill in gaps in the database, the Rosetta team last year set up a collaborative Web site (rosetta-project.org) through which scholars and native speakers of rare languages can submit and peer-review word lists, audio recordings, grammars and other kinds of documentation. By June, 664 volunteers (25 to 30 percent of them professional linguists, Mason estimates) had contributed material. In principle, the last speakers of moribund languages could upload their knowledge for the benefit of future generations. In practice, unfortunately, last speakers are typically old, poor and computer illiterate. Few have e-mail addresses.

—W.W.G.



HOLFE HORN (photograph). COURTESY OF THE LONG NOW FOUNDATION (www.longnow.org)

A new British philanthropy has set aside \$30 MILLION for a massive documentation project.

tween linguistic diversity and biodiversity, which seem to be highly concentrated in many of the same countries. Another international group drafted an ambitious "universal declaration of linguistic rights." The draft was submitted to UNESCO in 1996, but the organization has yet to act on the proposal.

An End to Apathy?

INDEED, DESPITE the near constant buzz in linguistics about endangered languages over the past 10 years, the field has accomplished depressingly little. "You would think that there would be some organized response to this dire situation," some attempt to determine which languages can be saved and which should be documented before they disappear, says Sarah G. Thomason, a linguist at the University of Michigan at Ann Arbor. "But there isn't any such effort organized in the profession. It is only recently that it has become fashionable enough to work on endangered languages."

Six years ago, recalls Douglas H. Whalen of Yale University, "when I asked linguists who was raising money to deal with these problems, I mostly got blank stares." So Whalen and a few other linguists founded the Endangered Languages Fund. But in the five years to 2001 they were able to collect only \$80,000 for research grants. A similar foundation in England, directed by Nicholas Ostler, has raised just \$8,000 since 1995. "I don't think the situation has changed in the seven years our foundation has existed," Ostler says. And no wonder. With so little research money available, says Steven Bird of the University of Pennsylvania, "anyone who wants to work on endangered languages has to forgo a more lucrative and secure career."

But there are encouraging signs that the field has turned a corner. The Volkswagen Foundation, a German charity, just issued its second round of grants totaling more than \$2 million, Whalen says. It has created a multimedia archive at the Max Planck Institute for Psycholinguistics in the Netherlands that can house

recordings, grammars, dictionaries and other data on endangered languages. To fill the archive, the foundation has dispatched field linguists to document Aweti (100 or so speakers in Brazil), Ega (about 300 speakers in Ivory Coast), Waima'a (a few hundred speakers in East Timor), and a dozen or so other languages unlikely to survive the century.

The Ford Foundation has also edged into the arena. Its contributions helped to reinvigorate a master-apprentice program created in 1992 by Leanne Hinton of Berkeley and Native Americans worried about the imminent demise of about 50 indigenous languages in California. Fluent speakers receive \$3,000 to teach a younger relative (who is also paid) their native tongue through 360 hours of shared activities, spread over six months. So far about 75 teams have completed the program, Hinton says, transmitting at least some knowledge of 25 languages.

"It's too early to call this language revitalization," Hinton admits. "In California the death rate of elderly speakers will always be greater than the recruitment rate of young speakers. But at least we prolong the survival of the language." That will give linguists more time to record these tongues before they vanish.

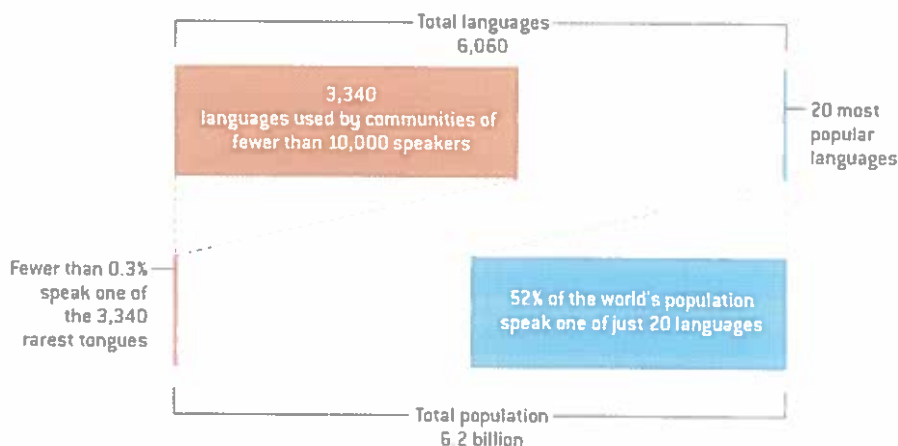
But the master-apprentice approach hasn't caught on outside the U.S., and Hinton's effort is a drop in the sea. At

least 440 languages have been reduced to a mere handful of elders, according to the *Ethnologue*, a catalogue of languages produced by the Dallas-based group SIL International that comes closest to global coverage. For the vast majority of these languages, there is little or no record of their grammar, vocabulary, pronunciation or use in daily life.

To help fill that need, the Lisbet Rausing Charitable Fund, a new British philanthropy, has set aside \$30 million for a massive documentation project. Barry Supple, an adviser to the foundation, says the money will probably be doled out over the course of eight to 10 years. Part will be given to the School of Oriental and African Studies in London to train linguists specifically on field documentation of dying languages. But most of the money will go to fieldwork itself. By the time the program ends, Supple says, "we expect to document about 100 endangered languages."

A New Tower of Babel

THE RAUSING documentation project is an order of magnitude larger than any previous effort. A key test will be whether it collects the records on all these languages in a consistent way and stores them in a safe and accessible archive. "The archives we have are generally impoverished," says Bird, who is associate



FEWER THAN FOUR PERCENT of the world's people are responsible for maintaining about 96 percent of the world's languages.

director of the Linguistic Data Consortium. "There is no archive that a university or national science foundation has committed to maintain indefinitely—say, for 25 or 50 years." He warns that languages may be recorded only to be lost again as the digital recording succumbs to obsolescence. "This is a huge issue," Whalen agrees.

Complicating matters further, dozens of institutions around the world are setting up digital libraries for data on endangered languages. This could create a tower of Babel of a new sort, because the projects plan to use inconsistent data formats, terminology and even names of languages.

Bird, Gary F. Simons of SIL International and many others have been work-

ing to bring some order to this chaos by building an "open language archives community" (OLAC) that uses metadata—a kind of digital card catalogue—to smooth out these inconsistencies. Launched in North America this past January and in Europe in May, OLAC encompasses more than 20 language repositories, including a number of those devoted to endangered languages. When the system begins operation next year, it will allow researchers to search a vast array of data to check out their theories about how languages evolved, about how the confluence of tongues reflects the migration of peoples, and about the limits of human speech.

Those are the main questions, after all, that linguists worry may become unanswerable with the loss of rare tongues. Linguistics is a young science still full of mysteries. Ostler offers one example: "Ica, spoken in northern Colombia, seems to have nothing comparable to a personal pronoun system—I, we, you, he,

she, it and they. Otherwise I would have thought [that] a linguistic universal."

Bird's colleague Michael B. Maxwell is fascinated by reduplication: a feature of numerous languages in which a repetition signifies meaning, such as a plural (as if the plural of "cat" were "catcat"). Lushootseed, a nearly extinct language of the Puget Sound area, is almost unique in its use of reduplication in three different forms—as prefix, suffix and even as root—Maxwell says: "If languages like this die out, we'll never know the limits of how reduplication can work in real languages."

Or consider a different puzzle of plural variation. In several languages, such as English, most words are either singular or plural. But just a few, such as the (probably recently deceased) Australian Aboriginal language Ngan'gitjemerri, have four forms for each noun: singular, dual, trial (three of a kind) and plural. Sursurunga, Tangga and Marshallese have five forms. What's the limit? It may already be too late to know.

CULTURE OF INDIGENOUS PEOPLES, such as this G/wi tribe in Botswana, is transmitted through its native language. If the language is lost, much of the oral tradition—stories and fables, knowledge of the local environment, even a unique worldview—vanishes with it.



"Ultimately, the answer to the problem of language extinction is **MULTILINGUALISM.**"

—James A. Matisoff, University of California, Berkeley

Better Alive Than Fossilized

EVEN IF A LANGUAGE has been fully documented, all that remains once it vanishes from active use is a fossil skeleton, a scattering of features that the scientist was lucky and astute enough to capture. Linguists may be able to sketch an outline of the forgotten language and fix its place on the evolutionary tree, but little more. "How did people start conversations and talk to babies? How did husbands and wives converse?" Hinton asks. "Those are the first things you want to learn when you want to revitalize the language."

But there is as yet no discipline of "conservation linguistics," as there is for biology. Almost every strategy tried so far has succeeded in some places but failed in others, and there seems to be no way to predict with certainty what will work where. Twenty years ago in New Zealand, Maori speakers set up "language nests," in which preschoolers were immersed in the native language. Additional Maori-only classes were added as the children progressed through elementary and secondary school. A similar approach was tried in Hawaii, with some success—the number of native speakers has stabilized at 1,000 or so, reports Joseph E. Grimes of SIL International, who is working on Oahu. Students can now get instruction in Hawaiian all the way through university. (They learn English as well.)

It is too early to tell whether this first generation of nest eggs will speak the native language to their children in the home. And immersion schools launched elsewhere have met with resistance from both within the community and without. Only one other indigenous language, Navajo, is taught this way in the U.S., according to the Center for Applied Linguistics. Leupp Public School on the Navajo reservation in Arizona started an immersion program after a survey there showed that only 7 percent of students could speak Navajo fluently. Children—initially kindergartners but now those up through fourth grade—use the language while raising sheep, tending gardens, performing traditional dances and otherwise learning about their culture. But the program has struggled to find qualified

teachers, to obtain Navajo language textbooks and tests, and to garner sufficient community support.

Ofelia Zepeda of the University of Arizona, who is perhaps the most prominent Native American advocate for indigenous language revival in the U.S., describes similar troubles with her own language, Tohono O'odham. "Like every tribe in the country, our problem is that a whole generation of children are non-speakers," she says. "The leadership supports language efforts, but the issue is funding. We've been waiting about three years to get our projects started." Even then, the small population of the tribe means that "we are essentially powerless in the grand scheme. Getting power over the schools in our own communities is a key necessity."

Just because a speech community is small does not mean that its language is doomed. At last report, notes Akira Yamamoto of the University of Kansas, there were just 185 people who spoke Karitiana. But they all lived in the same village in Brazil, which had just 191 inhabitants. So better than 96 percent of the population was still speaking the language and teaching it to their children. Because surveys of endangered languages tend to look only at the number of speakers, "there has been a history of linguists predicting the death of languages only to return 20 years later and find them still there," says Patrick McConvell of the Australian Institute of Aboriginal and Torres Strait Islander Studies in Canberra.

One factor that always seems to occur in the demise of a language, according to theorist Hans-Jürgen Sasse of the University of Cologne in Germany, is that the

speakers begin to have "collective doubts about the usefulness of language loyalty." Once they start regarding their own language as inferior to the majority language, people stop using it for all situations. Kids pick up on the attitude and prefer the dominant language. "In many cases, people don't notice until they suddenly realize that their kids never speak the language, even at home," Whalen says. This is how Cornish and some dialects of Scottish Gaelic slipped into extinction. And it is why Irish Gaelic is still only rarely used for daily home life in Ireland, 80 years after the republic was founded with Irish as its first official language.

"Ultimately, the answer to the problem of language extinction is multilingualism," Matisoff argues, and many linguists agree. "Even uneducated people can learn several languages, as long as they start as children," he says. Indeed, most people in the world speak more than one tongue, and in places such as Cameroon (279 languages), Papua New Guinea (823) and India (387) it is common to speak three or four distinct languages and a dialect or two as well.

"Most Americans and Canadians, to the west of Quebec, have a gut reaction that anyone speaking another language in front of them is committing an immoral act," Grimes observes. "You get the same reaction in Australia and Russia. It is no coincidence that these are the areas where languages are disappearing the fastest." The first step in saving dying languages is to persuade the world's majorities to allow the minorities among them to speak with their own voices. ■

W. Wayt Gibbs is senior writer.

MORE TO EXPLORE

The Green Book of Language Revitalization in Practice. Edited by Leanne Hinton and Kenneth Hale. Academic Press, 2001.

On Biocultural Diversity. Edited by Luisa Maffi. Smithsonian Institution Press, 2001.

Ethnologue: www.ethnologue.com

Teaching Indigenous Languages: <http://jan.ucc.nau.edu/~jar/TIL.html>